

The Relationship between Satisfaction with Pharmaceutical Services and Compliance with Medication Control in Glaucoma Patients at Undaan Eye Hospital, Surabaya

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ABSTRACT

Glaucoma is a leading cause of visual impairment and the second most common cause of permanent blindness after cataracts, with a prevalence that increases with age, including in Indonesia. The disease is characterized by damage to the optic nerve due to elevated intraocular pressure, which causes progressive loss of visual fields. The management of glaucoma heavily depends on patient adherence to medication and routine follow-up visits to prevent disease progression and serious complications. An important factor influencing patient adherence is the level of satisfaction with pharmaceutical services. This study aims to analyze the relationship between satisfaction with pharmaceutical services and adherence to follow-up treatment among glaucoma patients at Undaan Eye Hospital in Surabaya. This quantitative cross-sectional study involved 100 glaucoma patients meeting inclusion criteria. Data were collected using a validated pharmaceutical service satisfaction questionnaire and an observation sheet assessing adherence to follow-up visits, supplemented by IOP profile data from medical records. The results showed that 88% of respondents were satisfied with pharmaceutical services, and 85% were adherent to follow-up visits. Chi-square analysis revealed a significant relationship between satisfaction with pharmaceutical services and adherence to follow-up ($p = 0.000$; $p < 0.05$). Increased patient satisfaction positively influenced adherence and better IOP control (10–21 mmHg). High-quality pharmaceutical services, especially in the assurance dimension, support the success of glaucoma therapy.

Keywords: Glaucoma; Medication Control; Patient Compliance; Pharmaceutical Services.

INTRODUCTION

Glaucoma is the second leading cause of vision impairment and permanent blindness after cataracts. The disease is characterized by damage to the optic nerve due to increased intraocular pressure (IOP), which leads to a progressive and irreversible narrowing of the field of vision (1). In Indonesia, the prevalence of glaucoma reached 0.46%, while in East Java it was 0.55%, indicating that early detection and management are very important (2). Glaucoma management focuses on controlling intraocular pressure, both medically and surgically (3). Based on this, the effectiveness of therapy is highly dependent on the patient's compliance with the course of control for regular treatment (4). Previous research has shown that the compliance rate of glaucoma patients in various regions is still low, such as at Cicendo Eye Hospital Bandung, where 71.1% of patients do not comply with control (5).

One of the factors that affect compliance is satisfaction with pharmaceutical services. Quality pharmaceutical services include not only the administration of medicines, but also communication, education, and interaction between pharmacists and patients (6). Service dimensions such as reliability, empathy, assurance, and tangibles play an important role in shaping patient satisfaction, which can have an impact on medication adherence (7).

Research linking satisfaction with pharmaceutical services with control compliance of glaucoma patients is still limited, especially in Eastern Indonesia. Therefore, it is important to evaluate this relationship as an effort to improve the quality of service and the success of therapy. It is not yet known to what extent satisfaction with pharmaceutical services is related to compliance with the control of treatment of glaucoma patients at Undaan Eye Hospital Surabaya. The purpose of the study was to analyze the relationship between satisfaction with pharmaceutical services and compliance with treatment control of glaucoma patients at Undaan Eye Hospital Surabaya.

METHODS

This study utilized research instruments, including a pharmaceutical service satisfaction questionnaire (SERVQUAL-based), an observation sheet to assess visit compliance, informed consent forms, and stationery and documentation tools. Ethical approval was obtained from the Health Research Ethics Commission, Faculty of Health Sciences, PGRI Adi Buana University (No 159-KEPK, dated February 21, 2025). Patient medical record data to access information on intraocular pressure and standardized questionnaires that have been tested for validity and reliability.

Detailed Procedure

Initial Preparation: The researcher takes care of research permits from the faculty and hospital, as well as conducting an initial approach to the research subject.

Questionnaire Distribution: Respondents were asked to fill out a pharmaceutical service satisfaction questionnaire consisting of 5 dimensions: tangibles, reliability, responsiveness, assurance, and empathy. Respondents used a 5-point Likert scale for both expectation and perception sections: 1 = Strongly Dissatisfied; 2 = Dissatisfied; 3 = Satisfied; 4 = Strongly Satisfied. This questionnaire has gone through a validity and reliability test process (r count > 0.361 ; Cronbach's Alpha = 0.799) (6).

Compliance Observation: Compliance assessment is conducted by observing the number of patient visits during medical follow-up. Patients are considered compliant if they attend according to the schedule set by the doctor or healthcare staff. If a patient fails to attend more than 3 days past the scheduled appointment date, the patient is categorized as non-compliant.

Medical Data Collection: The patient's intraocular pressure data is taken from the medical record to support the analysis.

Data Processing and Analysis: Data is statistically analyzed using the Chi-Square test with the help of SPSS applications. This test was used to look at the relationship between two main variables: satisfaction with pharmaceutical services and control compliance.

RESULT AND DISCUSSION

Results Subsection

Validity and Reliability Test Results

In this study, validity and reliability tests have been carried out on 30 respondents, who have been said to be valid. It can be seen that if r calculated $> r$ table with a 90% confidence level of the r test table, then the question is valid. Based on this, the r table with $n = 30$ and $\alpha = 0.1$ is 0.306. Based on the results of the validity test, it can be concluded that all questions on the questionnaire that have been made by the researcher are valid. The questionnaire is stated to be reliable if Alpha-Cronbach > 0.60 and not reliable if Alpha-Cronbach < 0.60 . From the test results, it can be seen that the reliability value is $0.72 > 0.6$; the results state that all dimensions of the questionnaire questions are reliable/consistent.

Respondent Demographics

Age

Based on data from research results obtained from glaucoma patients at Undaan Eye Hospital Surabaya aged 18 to >65 years with a total of respondents 100 people, the distribution of respondents by age can be seen in the following table 1.

Table 1. Age Distribution of Respondents

Age	Sum	Percentage (%)
18-35 years old	8	8.0
36-45 years old	9	9.0
46-55 years old	23	23.0
56-65 years old	27	27.0
>65 years old	33	33.0
Total	100	100.0

Based on the following Table 1, respondents were grouped into five age ranges: 18–35 years (8%), 36–45 years (9%), 46–55 years (23%), 56–65 years (27%), and >65 years (33%). The majority of respondents were in the age group of >65 years, followed by the age group of 56–65 years. This suggests that most of the respondents are elderly, a group that is significantly more at risk of developing glaucoma. The increased risk of glaucoma in the elderly is caused by the aging process that results in changes in the structure and function of the eye, including a decrease in the efficiency of the eye fluid drainage system which can increase intraocular pressure (8). This finding is in accordance with research that found that 83% of glaucoma patients at RSKM Padang Eye Center are over 65 years old (8).

Gender

Based on the data of the gender distribution research on 100 respondents who have participated in the following research.

Table 2. Gender Distribution of Respondents

Gender	Sum	Percentage (%)
Man	40	40.0
Woman	60	60.0
Total	100	100.0

Based on Table 2, the distribution of respondents by gender shows that the majority are women (60%), while men are 40%. This proportion can be explained from the anatomical side, where women tend to have a shallower front eye chamber, a smaller anterior segment volume, and a shorter axial length of the eyeball than men (9). This condition causes the angle between the cornea and iris to become narrower, increasing the risk of angle closure, the main mechanism in closed-angle glaucoma. The position of the iris in a woman's eye is also more susceptible to being pushed forward during pupil dilation, which can block the iridocorneal angle and inhibit the flow of aqueous humor, thus triggering a sudden increase in intraocular pressure (IOP). If not treated immediately, this high IOP can lead to optic nerve damage and permanent blindness (9). In addition, changes in sex hormones in women also affect intraocular pressure and optic nerve circulation, which further increases the risk of glaucoma. These results are supported by Nasikun's research which shows that of 120 glaucoma patients, the majority were women as many as 66 people (55%) and men as many as 54 people (45%) (10).

Education

The results of the latest research data based on education are known to be glaucoma patients with education levels ranging from elementary to Master which have been filled with a total of 100 patient respondents. Based on the distribution of the respondents' education level, it can be seen as follows.

Table 3. Distribution of Respondent Education

Education	Sum	Percentage (%)
Elementary School	30	30.0
Junior High School	20	20.0
Senior High School	37	37.0
Diploma	3	3.0
Bachelor's	8	8.0
Master's	2	2.0
Total	100	100.0

The distribution of respondents education level was grouped into six categories, with the following details: elementary (30%), junior high (20%), high school (37%), diploma (3%), bachelor (8%), and master (2%). In this study divided level education into low and high level education, the low level education refer to Elementary School and Junior High School graduation, while high education refer to Senior High School graduation and above. The highest percentage of respondent education is high school graduates group, followed by elementary school graduates group. However, the results of this study are supported by Amelia's study which found that the majority of glaucoma patients have higher education (64.9%). Education is an important factor in the formation of a person's health awareness and behavior. Moreover, higher education levels are not always directly proportional to the understanding of diseases, including glaucoma. Lack of regular eye exams and unawareness of the early symptoms of glaucoma are still common, even in highly educated individuals (11).

Work

The data from the study is based on the level of work of respondents who have filled out a questionnaire with a total of 10 respondents'0 patient respondents. The distribution of respondents based on their work can be seen as follows.

Table 4. Distribution of Respondent Work

Work	Sum	Percentage (%)
Civil Servant	2	2.0
Pensioner	5	5.0
Not Working	18	18.0
Housewife	40	40.0
Private Employees	8	8.0
Self employed	27	27.0
Total	100	100.0

Based on employment data in Table 4, the most respondents were housewives (Housewife) as many as 40 people (40%), followed by self-employed people 27 people (27%), not working/unemployed 18 people (18%), private employees 8 people (8%), pensioner 5 people (5%), and civil servants 2 people (2%). The dominance of housewife as respondents in this study is closely related to the characteristics of glaucoma patients, the majority of whom are elderly women (12). Anatomically, women have a shallower front eye chamber and a shorter axial length, a condition that increases the risk of developing closed-angle glaucoma. In addition, changes in sex hormones in women also affect intraocular pressure, thus increasing susceptibility to glaucoma.

Other factors such as the lack of physical activity in most housewife's also contribute to increased intraocular pressure and decreased cardiovascular fitness, which are additional risk factors for glaucoma (13). Thus, the high number of glaucoma patients from housewife can be explained in terms of the biological, behavioral, and demographic aspects of elderly women in Indonesia.

Long Suffering from Glaucoma

Based on the results of the study, the distribution of glaucoma for a long time is known to range from less than 1 year to more than 10 years. This data has been filled in by respondents who are doing therapy at Undaan Eye Hospital Surabaya. The following distribution of respondents' income can be seen as follows.

Table 5. Distribution Long Suffering of Glaucoma Respondents

Long Suffering	Sum	Percentage (%)
<1 year	13	13.0
1-5 years	65	65.0
6-10 years	17	17.0
>10 years	5	5.0
Total	100	100.0

Based on old data on glaucoma in Table 5, the majority of respondents, 65 people (65%), had suffered from glaucoma for 1–5 years, indicating that most patients were in the intermediate phase of adaptation to the disease and therapy regimen. Meanwhile, 13 respondents with a duration of <1 year were 13 people (13%), 6–10 years as many as 17 people (17%), and >10 years as many as 5 people (5%). Patients with a 1–5 year stay period require a service approach that focuses on strengthening motivation and ongoing education to maintain compliance. On the other hand, patients who have recently been diagnosed (<1 year) and who have had glaucoma for a long time (>10 years) require intensive assistance, both in terms of understanding the disease and psychological support to avoid a long-term decline in adherence. This approach is important to increase the effectiveness of therapy as well as prevent the progression of glaucoma and its complications. (14) (15).

Disease History

The data from the research results at Undaan Eye Hospital, Surabaya, is based on the disease history of respondents who participated in the study, which was as many as 100 respondents starting from patients with no history of disease, DM, hypertension, chronic kidney disease, and cataracts. The results of the distribution from the disease history can be seen as follows.

Table 6. Distribution of Respondents' Disease History

Disease History	Sum	Percentage (%)
None	50	50.0
Diabetes Mellitus (DM)	17	17.0
Hypertension	28	28.0
Chronic Kidney Disease	1	1.0
Cataracts	4	4.0
Total	100	100.0

Based on Table 6, the majority of respondents (50%) had no history of disease, while the rest had a history of diseases such as hypertension (28%), diabetes mellitus/DM (17%), cataracts (4%), and chronic kidney disease (CKD) (1%). These findings suggest that half of the patients develop glaucoma without any underlying systemic comorbidities. Patients without a history of disease generally develop primary glaucoma, particularly acute closed-angle and open-angle types. In the acute closed angle type, there is a sudden closure of the angle of the

front eye due to anatomical characteristics such as the shallow front eye chamber and the short axial length of the eyeball, which is more common in females. Triggering factors such as sudden pupil dilation, stress, low light, a specific sleeping position, or medications can also trigger an acute surge in intraocular pressure (IOP)(14). In contrast, patients with comorbidities such as hypertension, DM, cataracts, or chronic kidney disease are more likely to develop secondary glaucoma. Hypertension and DM can cause damage to small blood vessels in the eye, disrupt the circulation of aqueous fluid humor, and increase IOP. DM also contributes to inflammation and damage to the optic nerve. Advanced cataracts can cause a narrowing of the angle of the front eye compartment, which increases the risk of closed-angle glaucoma. Meanwhile, patients with chronic kidney disease face metabolic and fluid impairments, which can affect blood pressure as well as IOP. Steroid use in the therapy of chronic kidney disease is also a risk factor for secondary glaucoma (15). Thus, both patients with and without a history of the disease require monitoring of eye health for early detection and prevention of glaucoma complications.

Pharmaceutical Service Satisfaction Profile and Patient Treatment Compliance

Pharmaceutical Service Satisfaction Profile

The distribution of pharmaceutical service satisfaction was carried out to 100 patients at the pharmacy poly when the patient received pharmaceutical services at Undaan Eye Hospital, Surabaya. The instrument used to assess the satisfaction of pharmaceutical services is a questionnaire that has been retested for validity and reliability beforehand (16). The results of the distribution of pharmaceutical service satisfaction are presented as follows.

Table 7. Distribution of Pharmaceutical Service Satisfaction

Pharmaceutical Service Satisfaction	Sum	Percentage (%)
Satisfied	88	88.0
Dissatisfied	12	12.0
Total	100	100.0

High levels of satisfaction encourage patients to actively access health services, especially when they need treatment (16). The satisfaction assessment of pharmaceutical services was conducted using SERVQUAL's five dimensions: tangible, reliability, responsiveness, assurance, and empathy. To achieve a high level of satisfaction with the pharmaceutical services provided to patients, at least high assessment results are required in 3 dimensions, namely responsiveness, assurance, and empathy. These 3 dimensions are related and will influence each other's results.

In the responsiveness dimension, describes how agile the Pharmacist is in serving and answering patient questions in easy language. High results on the assurance dimension indicate the level of pharmacist competence in providing pharmaceutical services to patients, which affects the speed in providing services. The higher the patient's confidence and trust in the pharmacist's competence in providing clear drug information, the greater the patient's satisfaction with the services received. Meanwhile, in the empathy dimension, it determines feelings of comfort and being appreciated when receiving pharmaceutical services. The tangible and reliability dimensions assess the service support facilities and pharmaceutical service systems implemented at the healthcare facility. These two dimensions are not directly related to pharmaceutical services but still influence overall patient satisfaction. The indicators measured from these two dimensions include: room comfort, availability of drugs, and standard procedures applied when providing pharmaceutical services.

Based on the results of the study, it is known that the majority of patients (88%) are satisfied with pharmaceutical services, while 12% stated that they are not satisfied. Pharmaceutical services are a form of professional responsibility of pharmacists in improving the quality of life of patients and become an important component of the health service system (6). Meanwhile, of the 12% respondents who were dissatisfied, complaints were found such as convoluted service procedures, lack of clarity of information, slow response to complaints, and discriminatory treatment based on social status. This shows that communication, education, and attitude of pharmacist need to be improved so that all patients, regardless of background, feel valued and well served.

Treatment Control Compliance Profile

The distribution of patient treatment control compliance was carried out on 100 respondents as seen from the medical records when the patient was re-treating at Undaan Eye Hospital, Surabaya. The instrument used to assess the patient's medication control compliance is an observation sheet. The results of the distribution of medication control compliance are presented as follows.

Table 8. Distribution of Compliance Control for Glaucoma Patients

Medication Control Compliance	Sum	Percentage (%)
Compliant	85	85.0
Non-Compliant	15	15.0
Total	100	100.0

Based on data from 100 respondents at Undaan Eye Hospital Surabaya, it is known that the majority of glaucoma patients show high adherence to treatment control, namely 85 people (85%) who are compliant and 15 people (15%) who are non-compliant. Although the compliance rate is relatively good, the presence of non-compliant patients suggests that this aspect still needs special attention in eye health services. Some of the main factors causing non-compliance include lack of knowledge and education. Many patients do not understand that glaucoma is a chronic disease that requires lifelong treatment and monitoring. In addition, the factor of aging and physical limitations is a significant obstacle, because the majority of glaucoma patients are elderly with limited mobility. Lack of family support, such as transportation assistance or reminders of control schedules, also affects compliance levels. Meanwhile, negative perceptions of health services, such as long waiting times and poor communication, can reduce patients' motivation to come for re-control (17). Non-adherence to medication control has a serious impact on the patient's clinical condition, such as increased intraocular pressure (TIO) and a sharp decrease in vision, which in the long term can lead to permanent blindness. The success of glaucoma therapy is highly dependent on the consistency of control and patient adherence to treatment (17).

Table 9. Distribution of Intraocular Pressure for Glaucoma Patients

Intraocular pressure	Sum	Percentage (%)
10-21 mmHg (normal)	85	85.0
>21 mmHg (height)	15	15.0
Total	100	100.0

The results in Table 9 showed that out of 100 respondents, 85 patients who complied with the treatment control had intraocular pressure (IOP) in the normal range (10–21 mmHg), while 15 non-compliant patients had high IOP. These findings reinforce the importance of adherence in routine control as a key factor in maintaining the stability of IOP in glaucoma patients. Increased IOP is a major risk factor for optic nerve damage. The higher the IOP, the greater the damage caused, and in some cases, the damage to vision is permanent. One common cause of uncontrolled IOP is non-compliance in the use of medications, specifically glaucoma eye drops that must be used consistently and appropriately. In addition, suboptimal response to therapy is also a factor, where some patients require a replacement or combination of medications because eye pressure does not decrease with a single regimen. Comorbidities such as diabetes, hypertension, and kidney failure also worsen IOP control because they affect metabolism and circulation of eye fluid. Anatomical factors of the eye, such as the narrow angle of the front eye space or disruption of the drainage system, also cause therapy to be less effective (18). However, regular control of treatment and adherence to drug use play an important role in maintaining the stability of IOP and preventing disease progression. In fact, in some cases, the field of view may improve slightly when eye pressure is successfully controlled (19). These results are consistent with Yulianti's research, which showed that patient compliance during the COVID-19 pandemic at Bali Mandara Eye Hospital reached 73.4% (19).

The Relationship of Pharmaceutical Service Satisfaction to Medication Control Compliance

Bivariate analysis was carried out to obtain and determine whether there was a relationship between the variables studied, namely satisfaction with pharmaceutical services and compliance with treatment control of glaucoma patients. This analysis is in accordance with the research objectives and the cross-sectional design used, and can statistically show whether there is a meaningful relationship between the two variables. The statistical test used is the Chi Square test.

Table 10 Relationship between Pharmaceutical Service Satisfaction and Medication Control Compliance

Pharmaceutical Service Satisfaction	Medication Control Compliance						P
	Compliant		Not	Compliant		Total	
	N	%	N	%	N	%	
Satisfied	83	94.3	5	5.7	88	100.0	0.000
Dissatisfied	2	16.7	10	83.3	12	100.0	
Total	85	85	15	15	100	100.0	

Based on Table 10, of the 88 patients who expressed satisfaction with pharmaceutical services, as many as 85 people (96.6%) were classified as compliant in carrying out treatment control. Meanwhile, of the 12 patients who were dissatisfied, most (15 people) were classified as non-compliant. The results of the Chi-Square test showed a value of $p = 0.000$ (< 0.05), which indicates that there is a significant relationship between pharmaceutical service satisfaction and patient control compliance. The satisfaction assessment in this study uses five *dimensions of SERVQUAL: tangible, reliability, responsiveness, assurance, and empathy*. Of the five dimensions, the assurance dimension obtained the highest value. Assurance reflects the pharmacist's competence, knowledge of the drug, as well as the ability to explain side effects and storage of medications, which builds trust and safety in patients. These results show that the higher the patient satisfaction, especially in the assurance dimension, the higher the level of patient compliance in undergoing treatment control. A good understanding of the disease and therapy, as well as professional interaction between patients and pharmacists, encourages patients to be more disciplined in following control schedules and treatment

recommendations. This research is supported by previous findings, such as Aulia Nur Fadilah and Yulianti et al, who stated that service satisfaction has a significant effect on patient compliance (20). The quality of service that meets expectations will encourage consumer loyalty and compliance.

CONCLUSION

Research on 100 glaucoma patients at Undaan Eye Hospital Surabaya in 2025 shows that the level of satisfaction with pharmaceutical services is relatively high with 88% of respondents stating satisfaction, especially in the assurance dimension which reflects trust in the competence and professionalism of pharmacy officers. In addition, the level of adherence to treatment control was also high, which was 85%, and the results of statistical tests showed a significant relationship between pharmaceutical service satisfaction and patient compliance ($p = 0.000 < 0.05$). The assurance dimension has been shown to have the most influence on compliance, where patients who feel confident in the ability of pharmacists are more likely to routinely control and follow treatment. Thus, the higher the patient satisfaction, the higher the compliance with treatment control.

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